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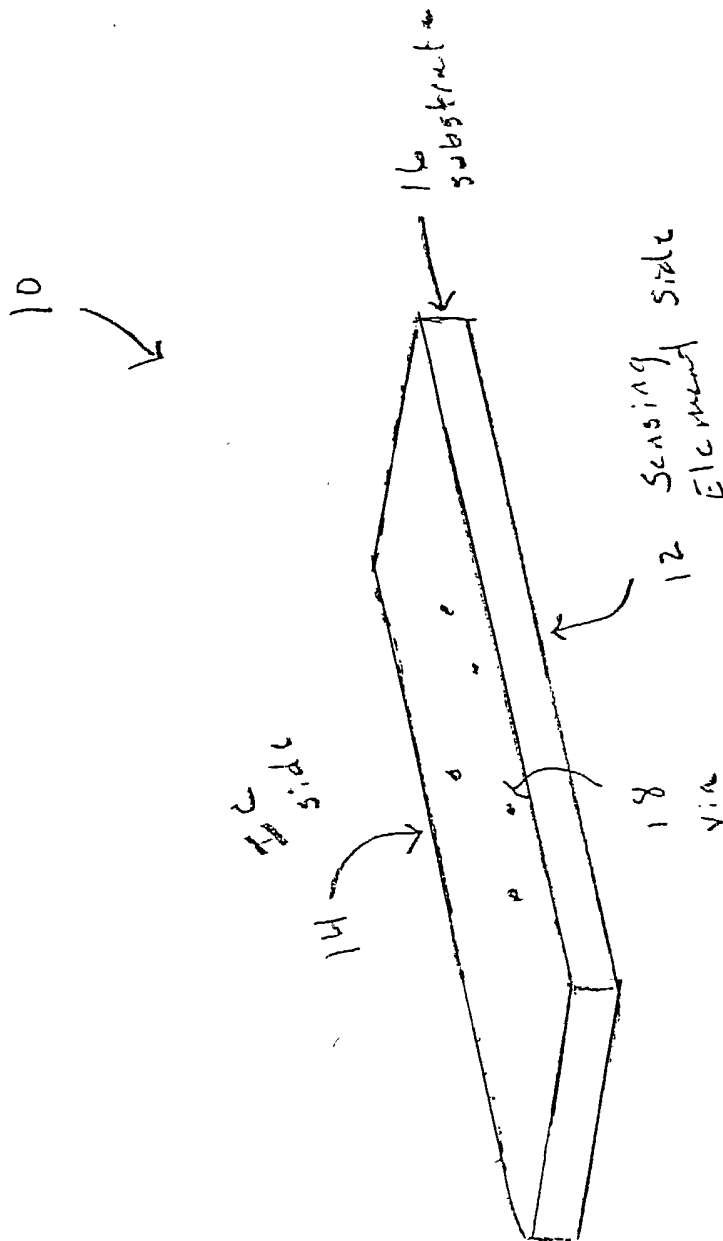


FIG. 1

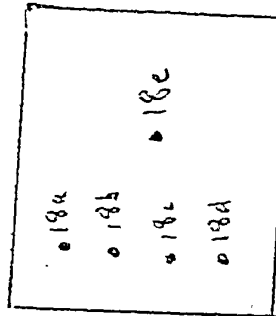
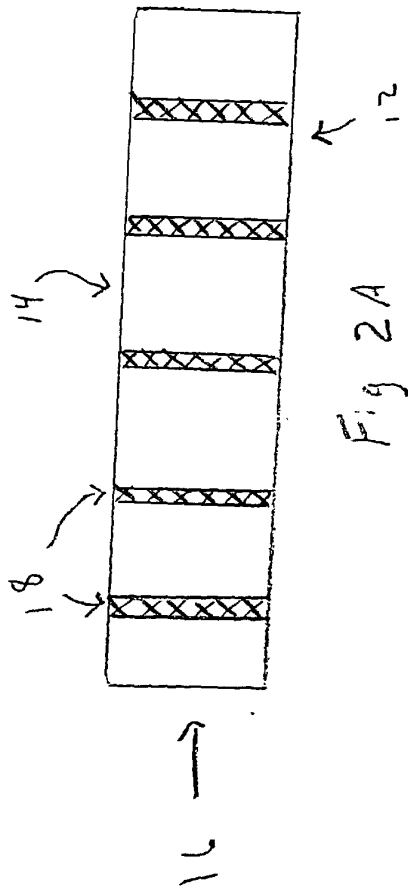
U.S. Express Mail No. EL926457574US

Title: SENSOR SUBSTRATE AND METHOD OF
FABRICATING SAME

Foley & Lardner - 310-277-2223

Atty: Ted Rittmaster - 047711-0280

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- 20 Obtain substrate material
- 22 Form vias
- 24 Fill vias
- 26 Deposit conductive layers
- 28 Place electronics and sensing element on substrate

Fig. 3

- 30 Obtain substrate material
- 32 Form vias
- 34 Anneal substrate
- 36 Fill vias
- 38 Fill meniscus
- 40 Lap off excess

Fig. 4

- 42 Place screen on top of substrate
- 44 Push filler through screen
- 46 Pull vacuum on opposite side of substrate
- 48 Fire substrate
- 50 Check via and repeat as necessary

Fig. 5



Fig. 6A

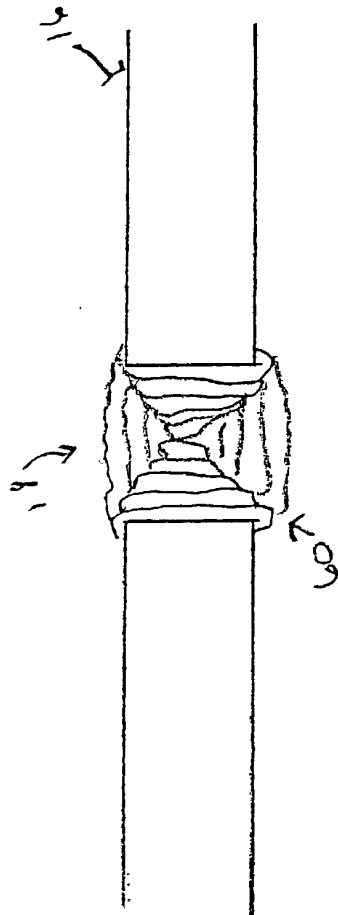


Fig. 43


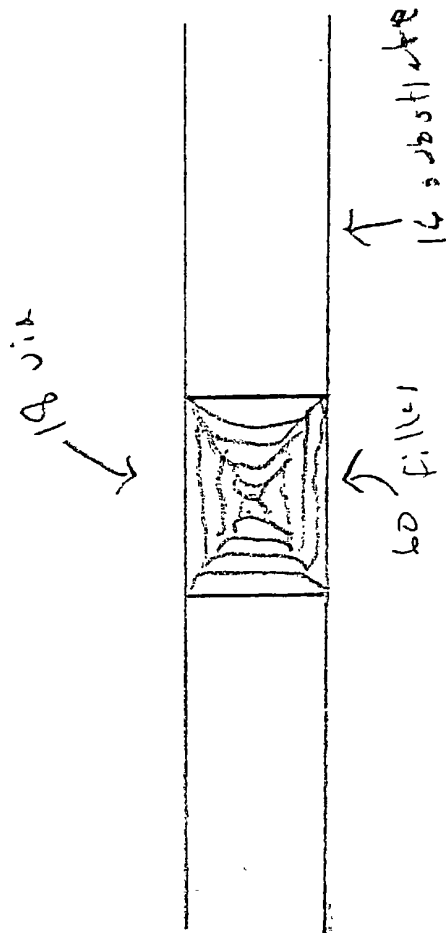
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- 70 Place substrate into vacuum
 - 72 Print filler on top of meniscus
 - 74 Vent substrate to atmosphere
 - 76 Fire substrate

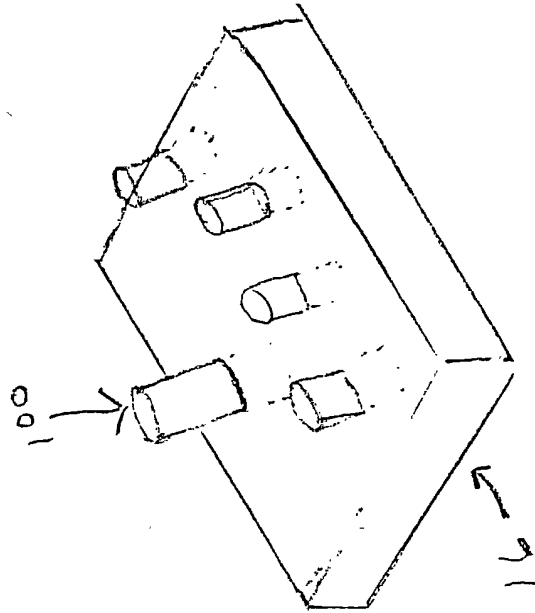
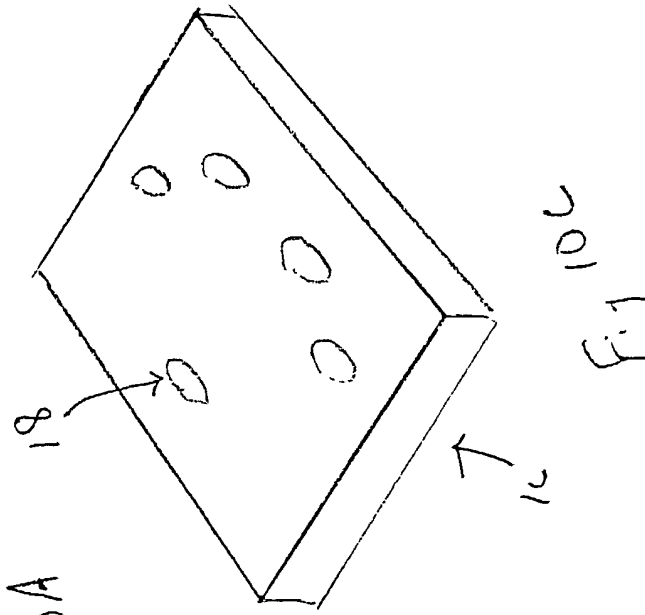
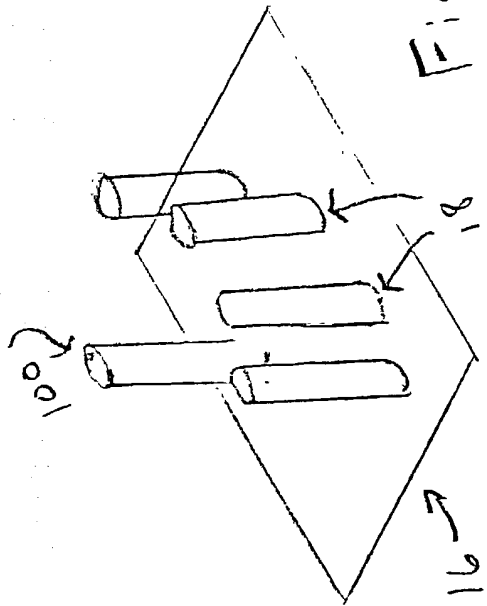
Fig. 7





- 80 Apply metalization pattern to electronics side of substrate
- 82 Place pillars on top of vias
- 84 Coat substrate
- 86 Dissolve pillars
- 88 Apply metalization layer to electronics side of substrate
- 90 Apply metalization pattern to sensing element side of substrate
- 92 Place caps over via location

Fig. 9



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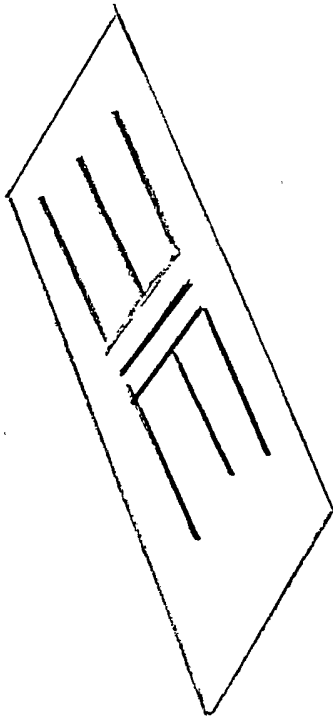


FIG. 11

- 110 Epoxy IC to pad
- 111 Wire bond leads
- 112 Place solder paste on capacitor
- 113 Layer solder paste along gold ring
- 114 Reflow substrate
- 115 Clean
- 116 Hold lid over substrate and bake
- 117 Solder lid onto substrate

Fig. 12

- 120 Identify material grain
- 122 Cut blanks
- 124 Anneal blanks
- 126 Form blanks into desired shape

Fig. 13

- 130 Put substrate into chamber
- 132 Place leak test fluid into reservoir
- 134 Pressurize chamber and pour leak test fluid over substrate
- 136 Release pressure and observe

Fig. 14

- 140 Place board into fixture
- 142 Electroplate electrodes
- 144 Rinse
- 146 Silver plate reference electrode
- 148 Rinse
- 150 Put board into reference inducing solution
- 152 Coat electroplated surface
- 154 Cure coating
- 156 Dispense buffer
- 158 Laser trim
- 160 Coat board
- 162 Anneal
- 164 Coat
- 166 Anneal

Fig. 15

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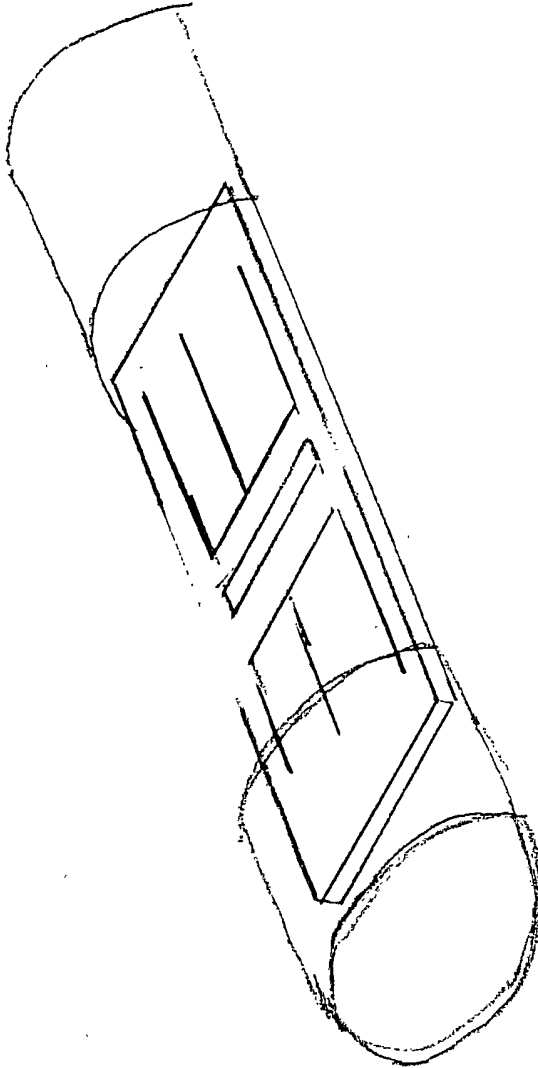


Fig. 16

- 170 Form vias and anneal substrate
- 172 Fill vias and fire substrate
- 174 Screen print and fire conductors on electronics side of substrate
- 176 Pattern photoresist
- 178 Form metalization layer on electronics side of substrate
- 180 Deposit pillars on electronics side of substrate
- 182 Deposit alumina over electronics side of substrate
- 184 Remove pillars
- 186 Pattern photoresist
- 188 Form metalization layer on alumina
- 190 Pattern photoresist on sensing element side of substrate
- 192 Form metalization layer on sensing element side of substrate
- 194 Deposit caps over vias on sensing element side of substrate
- 196 Remove unwanted metal on both sides of the substrate

FIG. 17